



**UNITED STATES DEPARTMENT OF COMMERCE**  
**Patent and Trademark Office**

Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
-----------------	-------------	----------------------	---------------------

08/932,228 09/17/97 SCHUEGRAF

K MICRON.009DV

EXAMINER

MMC2/0629

KNOBBE MARTENS OLSON AND BEAR  
620 NEWPORT CENTER DRIVE  
SIXTEENTH FLOOR  
NEWPORT BEACH CA 92660-8016

VU, H

ART UNIT

PAPER NUMBER

2811

DATE MAILED:

06/29/00

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

# Office Action Summary

Application No.

08/932,228

Applicant(s)

SCHUEGRAF ET AL.

Examiner

HUNG VU

Group Art Unit

2811



☒ Responsive to communication(s) filed on Jun 5, 2000

☒ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

## Disposition of Claims

☒ Claim(s) 11-16 is/are pending in the application.

Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

☐ Claim(s) \_\_\_\_\_ is/are allowed.

☒ Claim(s) 11-16 is/are rejected.

☐ Claim(s) \_\_\_\_\_ is/are objected to.

☐ Claims \_\_\_\_\_ are subject to restriction or election requirement.

## Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some\* ☐ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) \_\_\_\_\_.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

## Attachment(s)

☒ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). \_\_\_\_\_

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

Art Unit: 2811

## **DETAILED ACTION**

### ***Response to Amendment***

1. Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn. In view of a further search, however, a new rejection is set forth further below.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 11 and 15 are rejected under 35 U.S.C. 102(a) as being anticipated by Anjum et al. (PN 5,372,951).

Anjum et al. discloses an isolation structure in a semiconductor substrate comprising,

a recessed portion formed therein in the semiconductor substrate;

a dielectric material comprising a halide-doped silicon oxide (36,38) filling the recessed portion, the dielectric material having a dielectric constant lower than the dielectric constant of silicon dioxide. Note Figure 5 of Anjum et al..

Art Unit: 2811

*Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 12-14 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bose et al. (PN 5,492,858, of record) in view of Anjum et al. (PN 5,372,951).

Bose et al. discloses an isolation structure in a semiconductor substrate comprising,

a recessed portion (20,21,22) formed therein in the semiconductor substrate (10);

a dielectric material (14) filling the recessed portion;

wherein the recessed portion comprises a trench structure having a ratio of height to width of less than 2:1;

a barrier layer (13,18) disposed between the recessed portion of the semiconductor substrate and the dielectric material. Note Figures 1-5 of Bose et al..

Bose et al. discloses the dielectric material comprising silicon oxide. Bose et al. does not disclose the silicon oxide comprising a halide-doped. However, Anjum et al. discloses an isolation structure (36,38) having silicon oxide comprised halide-doped. Note Figure 5 of Anjum et al..

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the recessed portion of Bose et al.'s having the silicon oxide comprising halide-

Art Unit: 2811

doped, such as taught by Anjum et al. in order to dislodge oxygen at silicon-oxygen bond sites and to enhance thickening effect of oxide regions.

With regard to claim 13, Bose et al. and Anjum et al. disclose all of the claimed limitations except a depth of less than 200 nm. However, it would have been obvious to the one of ordinary skill in the art at the time the invention was made to form a trench having a depth of less than 200 nm because such structure is well-known in the art in order to decrease the void formation and to increase the surface planarity of the final trench structure. Note Swan et al. (PN 5,356,838, of record) is cited to support the well-known position.

#### ***Response to Arguments***

4. Applicant's arguments with respect to claim 11 have been considered but are moot in view of the new ground(s) of rejection.

#### ***Conclusion***

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after

Art Unit: 2811

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Papers related to this application may be submitted to Technology center (TC) 2800 by facsimile transmission. Papers should be faxed to TC 2800 via the TC 2800 Fax center located in Crystal Plaza 4, room 4-C23. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The Group 2811 Fax Center number is (703) 308-7722 and 308-7724. The Group 2811 Fax Center is to be used only for papers related to Group 2811 applications.

Any inquiry concerning this communication or any earlier communication from the Examiner should be directed to ***Hung Vu*** whose telephone number is **(703) 308-4079**. The Examiner is in the Office generally between the hours of 7:30 AM to 4:00 PM (Eastern Standard Time) Monday through Friday.

Any inquiry of a general nature or relating to the status of this application should be directed to the **Technology Center Receptionists** whose telephone number is **(703) 308-0956**.

Serial Number: 08/932,228

Page 6

Art Unit: 2811

Vu

June 27, 2000

STEVEN H. LOKE  
PRIMARY EXAMINER  
GROUP 2500

*Steven Hoke*